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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/808,250

03/24/2004

Takamitsu Higuchi

9319G-000747

4209

27572 7590 04/02/2007
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EXAMINER

SONG, MATTHEW J

ART UNIT

PAPER NUMBER

1722

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/02/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/808,250

Applicant(s)

HIGUCHI ET AL.

Examiner

Matthew J. Song

Art Unit

1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☒ Claim(s) 6-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 1/9/2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number 10/916208 has been reviewed and is accepted. The terminal disclaimer has been recorded.
2. The terminal disclaimer filed on 1/9/2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number 10/761,147 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

3. Applicant's arguments, see pages 7-8 of the remarks, filed 1/9/2007, with respect to the obviousness type double patenting rejections over 0/761,147 and 10/916208 have been fully considered and are persuasive. The rejections of claims 1-13 have been withdrawn.
4. Applicant's arguments, see page 5 of the remarks, filed 1/9/2007, with respect to the 35 U.S.C. 103 rejection over Komatsu and Burger have been fully considered and are persuasive. The rejection of claims 1-5 has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Komatsu et al and Nashimoto et al (US 6,470,125) and Sun et al (US 2001/0016229).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu et al ("Growth and Characterization of Potassium Niobate (KNbO₃) Crystal from an Aqueous Solution" from IDS filed 3/24/2004") in view of Nashimoto et al (US 6,470,125) and Sun et al (US 2001/0016229 A1).

Komatsu et al teaches a method of growing single crystal potassium niobate (KN) by precipitating orthorhombic KN from an aqueous solution (Abstract and pg 5659). Komatsu et al also teaches the epitaxial growth of KN growth on a substrate because KN grows by spontaneous

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nucleation in the aqueous solution with K_2NbO_3F (Abstract and pg 5659), this clearly suggests manufacturing a thin film from a liquid of potassium niobate solution.

Komatsu et al does not teach coating liquid drops of KN solution on the substrate.

In a method of coating a substrate with a solution, note entire reference, Okada et al teaches forming a thin film by an ink jet method including a step of discharging a liquid while the discharge ports are being moved relative to the substrate (Abstract).

Komatsu et al teaches epitaxial growth of KN from an aqueous solution on a substrate and is not particular to the method of contacting the aqueous solution with the substrate. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Komatsu et al by using a conventionally known method of coating a liquid on a substrate using the method taught by Okada et al because Okada et al's method is a known method of delivery solution to a substrate in a precise amount and location for forming a thin film.

The combination of Komatsu et al and Okada et al does not teach coating and precipitation are carried out repeatedly and the coating is carried out so that liquid drops applied are overlapped with part of the crystal precipitated in a previous precipitating.

In a method of solution crystal growth, note entire reference, Sun et al teaches after coating a substrate with a solution, the substrate is heated and crystallized ([0044]). Sun et al also teaches the coating and heating steps may be repeated until the film reaches the desired thickness ([0044]), this clearly suggests applicant's overlapping drops because the drops are coated over the previously grown layer to increase thickness.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Komatsu et al and Okada et al by repeating the coating and crystallization steps, as taught by Sun et al, to grow a thin film with a desired thickness.

Referring to claim 2, the combination of Komatsu et al, Okada et al and Sun et al teaches an ink drop method.

Referring to claim 3, the combination of Komatsu et al, Okada et al and Sun et al is silent to the volume of the drop, however the ink drop method is known to be able to produce drops of less than 100 picoliters, as evidenced by Capps et al (US 5,997,124). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Komatsu et al, Okada et al and Sun et al by using drop size of less than 100 picoliters to drop precise amount of solution.

Referring to claim 5, the combination of Komatsu et al, Okada et al and Sun et al teaches potassium niobate fluoride aqueous solution (Komatsu et al Abstract).

Allowable Subject Matter

7. Claims 6-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to claims 1-3 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nashimoto et al (US 6,470,125) teaches an ink jet method can be used to coat a substrate with a solution and the solution is heated to grow a thin film by epitaxial growth (col 29, ln 1-15).

Capps et al (US 5,997,124) teaches a typical characteristic drop volume in ink jet nozzles will range from 28-35 picoliters (col 5, ln 20-40).

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

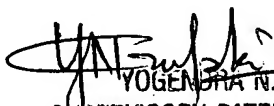
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


MATTHEW J. SONG
Examiner
YOGENDRA N. GUPTA Art Unit 1722
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

MJS
March 29, 2007